

REMARKS

Entry of the foregoing amendment(s) is respectfully requested.

The claims have been amended to eliminate multiple dependency and to place them in better condition for U.S. patent practice.

Should the Examiner have any questions concerning the subject application, a telephone call to the undersigned would be appreciated.

Respectfully submitted,

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By:

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Date: December 11, 2001

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1. (Amended) A process for carrying out impregnation and/or for preparing a coating which gives release and is leaktight employed at the *engine block/cylinder head* interface of engines and applied [in particular] to sheet gaskets, [in particular cylinder head gaskets,

characterized in that it consists essentially] comprising:

1 - [in] employing a silicone composition comprising:

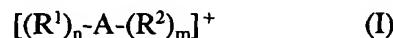
-A- 100 parts by weight of at least one polyorganosiloxane (POS) crosslinkable by the cationic and/or radical route and via crosslinking functional groups (CFGs), these CFGs being identical to or different from one another and being [chosen] selected from [those comprising] the group consisting of at least one functional unit of heterocyclic nature having one or more electron-donating atoms and/or from those which are ethylenically unsaturated and substituted by at least one electron-donating atom which enhances the basicity of the π system;

-B- from 0.01 to 10 parts by weight of at least one initiator salt (PI) formed by a borate of an onium of an element from groups 15 to 17 of the Periodic Classification [[Chem. & Eng. News, Vol. 63, No. 5, 26 of February 4, 1985]] or of an organometallic complex of an element from groups 4 to 10 of the Periodic Classification [(same reference)],

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the cationic entity of said borate being [chosen] selected from the group consisting of:

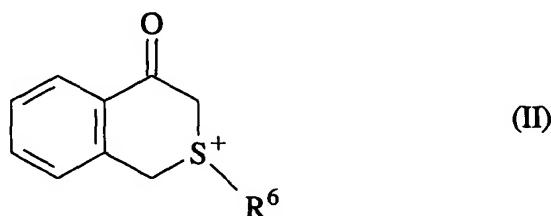
(1) - onium salts of formula (I):



in which formula:

- A represents an element from groups 15 to 17;
- R¹ represents a C₆-C₂₀ carbocyclic or heterocyclic aryl radical, it being possible for said heterocyclic radical to comprise nitrogen or sulfur as heteroelements;
- R² represents R¹ or a linear or branched C₁-C₃₀ alkyl or alkenyl radical; said R¹ and R² radicals optionally being substituted by a C₁-C₂₅ alkoxy, C₁-C₂₅ alkyl, nitro, chloro, bromo, cyano, carboxy, ester or mercapto group,
- n is an integer ranging from 1 to v + 1, v being the valency of the element A,
- m is an integer ranging from 0 to v - 1, with n + m = v + 1

(2) - the oxoisothiochromanium salts having the formula:

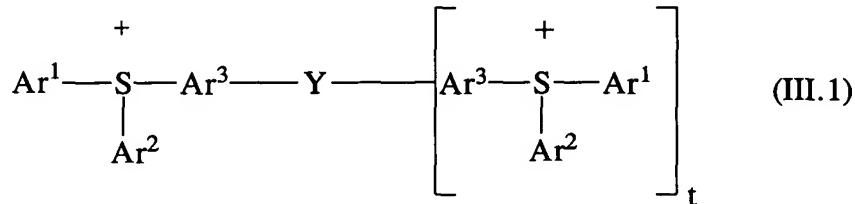


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where the R⁶ radical represents a linear or branched C₁-C₂₀ alkyl radical;

(3) - sulfonium salts where the cationic entity comprises:

→ 3.1. at least one polysulfonium species of formula III.1

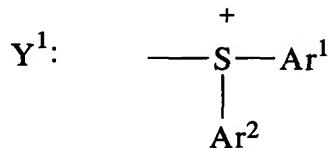


in which:

- the Ar¹ symbols, which can be identical to or different from one another, each represent a monovalent phenyl or naphthyl radical optionally substituted with one or more radicals [chosen] selected from the group consisting of: a linear or branched C₁-C₁₂ alkyl radical, a linear or branched C₁-C₁₂ alkoxy radical, a halogen atom, an -OH group, a -COOH group, a -COO-alkyl ester group, where the alkyl part is a linear or branched C₁-C₁₂ residue, and a group of formula -Y⁴ Ar², where the Y⁴ and Ar² symbols have the meanings given immediately below,
- the Ar² symbols, which can be identical to or different from one another or Ar¹ each represent a monovalent phenyl or naphthyl radical optionally substituted with one or more radicals [chosen] selected from the group consisting of: a linear or branched C₁-C₁₂ alkyl radical, a linear or branched C₁-C₁₂ alkoxy radical, a halogen atom, an -OH group, a -COOH group or a -COO-alkyl ester group, where the alkyl part is a linear or branched C₁-C₁₂ residue,

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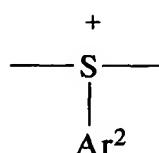
- the Ar³ symbols, which can be identical to or different from one another, each represent a divalent phenylene or naphthylene radical optionally substituted with one or more radicals chosen from: a linear or branched C₁-C₁₂ alkyl radical, a linear or branched C₁-C₁₂ alkoxy radical, a halogen atom, an -OH group, a -COOH group or a -COO-alkyl ester group, where the alkyl part is a linear or branched C₁-C₁₂ residue,
- t is an integer equal to 0 or 1,
- + with the additional conditions according to which:
- + when t = 0, the Y symbol is then a Y¹ monovalent radical representing the group of formula:



where the Ar¹ and Ar² symbols have the meanings given above,

- + when t = 1:
 - * on the one hand, the Y symbol is then a divalent radical having the following meanings Y² to Y⁴:

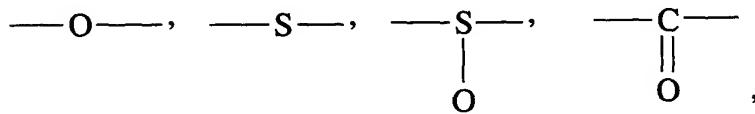
Y²: a group of formula:



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where the Ar² symbol has the meanings given above,

- Y³: a single valency bond,
- Y⁴: a divalent residue [chosen] selected from the group consisting of:



a linear or branched C₁-C₁₂ alkylene residue and a residue of formula
-Si(CH₃)₂O-,

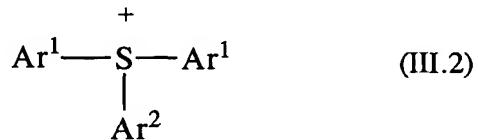
- * on the other hand, solely in the case where the Y symbol represents Y³ or Y⁴, the Ar¹ and Ar² (terminal) radicals have, in addition to the meanings given above, the possibility of being connected to one another via the Y', residue

[consisting in] comprising Y¹, a single valency bond, or in Y¹², a divalent residue [chosen] selected from the residues cited with respect to the definition of Y⁴, which is inserted between the carbon atoms, facing each other, situated on each aromatic ring in the ortho position with respect to the carbon atom directly bonded to the S⁺ cation;

- 3.2. and/or at least one monosulfonium species having a single S⁺ cationic center per mole of cation and [consisting] comprising, in the majority of cases, in species of formula:

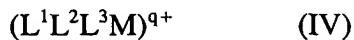
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in which Ar¹ and Ar² have the meanings given above with respect to the formula (III.1), including the possibility of connecting directly between them only one of the Ar¹ radicals to Ar² according to the way indicated above with respect to the definition of the additional condition in force when t=1 in the formula (II) involving the Y' residue;

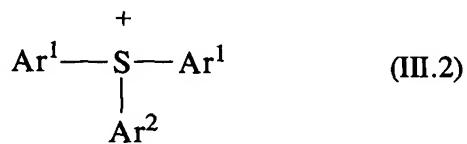
(4) organometallic salts of formula (IV):



in which formula:

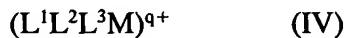
- M represents a metal from group 4 to 10,
- L¹ represents 1 ligand bonded to the metal M via π electrons, which ligand is [chosen] selected from the group consisting of η^3 -alkyl, η^5 -cyclopentadienyl and η^7 -cyclo- heptratrienyl ligands and η^6 -aromatic compounds [chosen] selected from the group consisting of optionally substituted η^6 -benzene ligands and compounds having from 2 to 4 condensed rings, each ring being capable of contributing to the valency layer of the metal M via 3 to 8 π electrons,
- L² represents a ligand bonded to the metal M via π electrons, which ligand is [chosen] selected from the group consisting of η^7 -cycloheptatrienyl ligands and η^6 - aromatic compounds [chosen]

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in which Ar¹ and Ar² have the meanings given above with respect to the formula (III.1), including the possibility of connecting directly between them only one of the Ar¹ radicals to Ar² according to the way indicated above with respect to the definition of the additional condition in force when t=1 in the formula (II) involving the Y' residue;

(4) organometallic salts of formula (IV):



in which formula:

- M represents a metal from group 4 to 10,
- L¹ represents 1 ligand bonded to the metal M via π electrons, which ligand is [chosen] selected from the group consisting of η^3 -alkyl, η^5 -cyclopentadienyl and η^7 -cyclo- heptratrienyl ligands and η^6 -aromatic compounds [chosen] from the group consisting of optionally substituted η^6 -benzene ligands and compounds having from 2 to 4 condensed rings, each ring being capable of contributing to the valency layer of the metal M via 3 to 8 π electrons,
- L² represents a ligand bonded to the metal M via π electrons, which ligand is [chosen] selected from the group consisting of η^7 -cycloheptatrienyl ligands and η^6 - aromatic compounds [chosen]

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selected from the group consisting of optionally substitute η^6 -benzene ligands and compounds having from 2 to 4 condensed rings, each ring being capable of contributing to the valency layer of the metal M via 6 or 7 π electrons,

- L^3 represents from 0 to 3 identical or different ligands bonded to the metal M via σ electrons, which ligand(s) is (are) [chosen from] CO [and] or $N_2O_2^+$; the total electronic charge q of the complex to which L^1 , L^2 and L^3 and the ionic charge of the metal M contribute being positive and equal to 1 or 2;

the anionic entity [lacuna] borate having the formula:



in which formula:

- a and b are integers ranging from 0 to 3 for a and from 1 to 4 for b,

with $a + b = 4$.

- the X symbols represent:

* a halogen atom with $a \equiv 0$ to 3.

* an OH functional group with $a \equiv 0$ to 2.

- the R symbols are identical or different and represent

- ▶ a phenyl radical substituted by at least one electron-withdrawing group and/or by at least 2 halogen atoms, this being when the cationic entity is an onium of an element from groups 15 to 17,

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- ▷ a phenyl radical substituted by at least one electron-withdrawing element or group, this being when the cationic entity is an organometallic complex of an element from groups 4 to 10,
- ▷ an aryl radical comprising at least two aromatic nuclei, which is optionally substituted by at least one electron-withdrawing element or group, whatever the cationic entity;

-C- 1 to 50 parts by weight of at least one reactive diluent consisting in a nonorganosilicon organosilicon or organic compound comprising, in its structure, at least one CFG as defined above and optionally at least one secondary functional group (SFG) other than a CFG but capable of reacting chemically with a CFG;

-D- 0 to 10 parts by weight of at least one pigment;

-E- 0 to 100 parts by weight of a filler of inorganic nature;

-F- 0 to 10 parts by weight of at least one photosensitizer;

-G- 0 to 10^{-2} part by weight of a stabilizer [consisting in] comprising at least one stabilizing amine agent,

-H- 0 to 5 parts by weight of an adhesion promoter;

2 - [in] applying this composition to a support (cylinder head sheet gasket or cylinder head/ engine block interface), and

3 - [in] crosslinking the applied composition by photochemical and/or thermal activation and/or under an electron beam.

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2. (Amended) The process as claimed in claim 1, [characterized in that]
wherein the support is a metal cylinder head gasket.

3. (Amended) The process as claimed in claim 2, [characterized in that]
wherein the support is a metal multilayer cylinder head gasket and [in that] a coating is
formed on at least one of the faces of at least one of the layers [composing] comprising the
metal multilayer cylinder head gasket.

4. (Amended) The process as claimed in [any one of claims 1 to 3] claim 1,
[characterized in that] wherein the functional units included in the CFG groups are selected
from the group consisting of the following units:

- an ethylenically unsaturated and activated functional group,
- epoxide,
- oxethane,
- and their mixtures,

and in that the functional units included in the optional SFG groups are selected from the
group consisting of the following units:

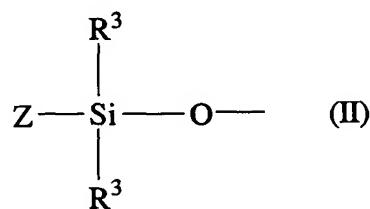
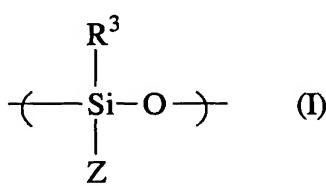
- hydroxyl,
- alkoxy,
- carboxyl,
- and their mixtures.

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5. (Amended) The process as claimed in [any one of claims 1 to 4] claim 1,
[characterized in that] wherein the POSSs A are epoxysilicones and/or vinyl ether silicones
which are:

→ either linear or substantially linear and [composed] comprised of units of formula (I), terminated by units of formula (II),

→ or cyclic and [composed] comprised of units of formula (II):



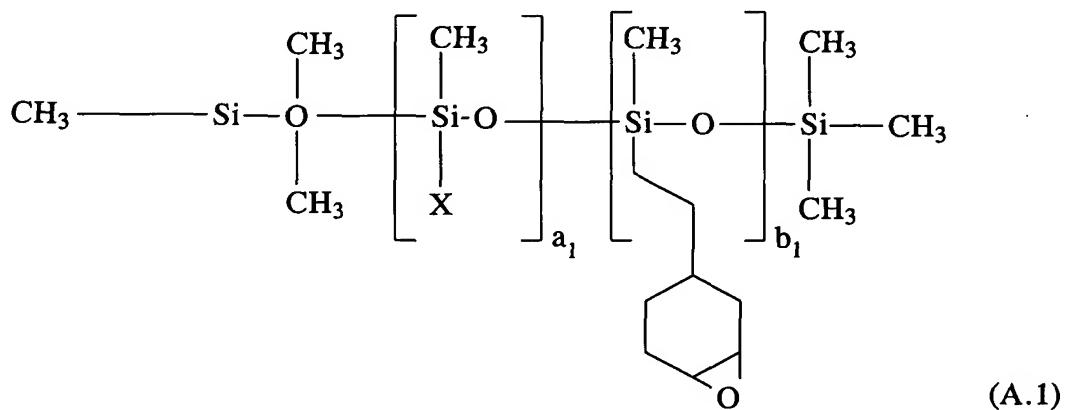
in which formulae:

- the R³ symbols are alike or different and represent:
 - either a hydroxyl radical,
 - or a linear or branched C₁-C₁₈ alkyl radical which is optionally substituted by one or more halogens and/or a hydroxyl radical,
 - or a C₂-C₈ alkenyl radical,
 - or an optionally substituted C₅-C₈ cycloalkyl radical,
 - or an aryl or aralkyl radical which is optionally substituted by halogens and/or alkoxyls,
- the Z symbols are alike or different and represent:
 - either the R³ radical,

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- or a CFG group corresponding to an epoxide or vinyl ether residue connected to the silicon via a divalent radical comprising from 2 to 20 carbon atoms and optionally comprising a heteroatom,
at least one of the Z symbols corresponding to a CFG group.

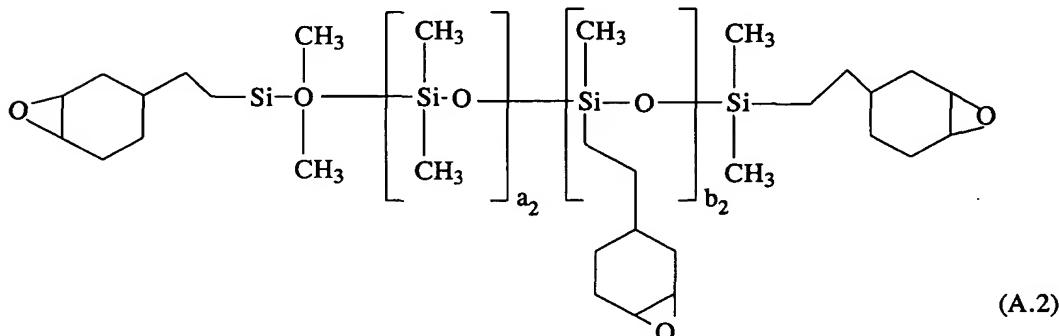
6. (Amended) The process as claimed in [any one of claims 1 to 5] claim 1,
[characterized in that] wherein the POSSs A are epoxysilicones of formula (A.1), (A.2) and
(A.3):



[with] wherein X = CH₃; phenyl; C₅-C₈ cycloalkyl; C₁-C₁₈ alkyl; C₂-C₈ alkenyl; -OH; H; -CH₂-CH₂-CH₂-OH; -CH₂-CH₂-CF₃ or -(CH₂)_n-CF₃, n = 1 to 20;

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- a_1 , a_2 , b_1 and b_2 being defined as follows in these formulae (A.1) and (A.2)

$$1 \leq a_1, a_2 \quad 1 \leq b_1, b_2$$

- a_2 and b_2 being = 0 in the formula (A. 2) to give the epoxidized disiloxane (A.3).

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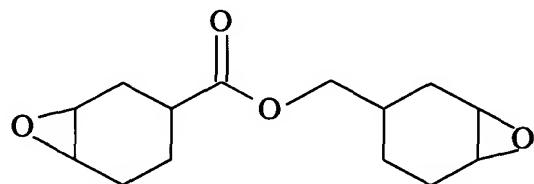
7. (Amended) The process as claimed in [any one of claims 1 to 6] claim 1,
[characterized in that] wherein the reactive diluent(s) C is (are) [chosen] selected from the
group consisting of:

→ [from] the nonorganosilicon organic compounds (C₁) possessing CFG

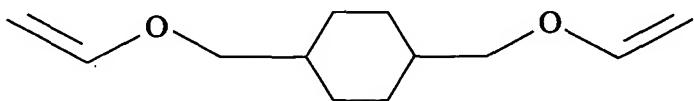
+ optionally SFG reactive groups having the following formulae:

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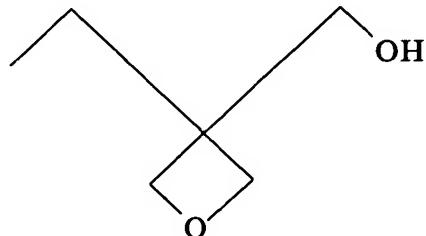
(C₁)



(C₁')



(C₁"')

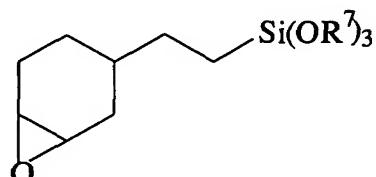


(C₁"") HO-(CH₂)₄-O-CH=CH₂

→ and/or from the organosilicon compounds (C₂) possessing CFG + optionally

SFG reactive groups having the following formulae:

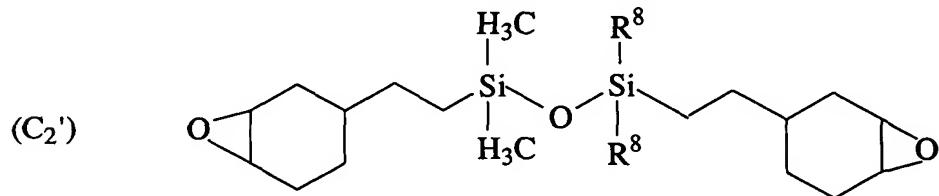
(C₂)



with R⁷= C₁-C₁₀ alkyl,

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with R⁸ independently representing a C₁-C₁₀ alkyl.

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8. (Amended) The process as claimed in [any one of claims 1 to 7] claim 1, [characterized in that] wherein the diluent (C) exhibits a boiling point B.p. $\geq 100^{\circ}\text{C}$ at standard atmospheric pressure and a viscosity at 25°C $\eta \leq 100 \text{ mPa.s.}$

9. (Amended) The process as claimed in [any one of claims 1 to 8] claim 1, [characterized in that] wherein, prior to stage 1, the support to be coated is covered using an adhesion primer of the type of those comprising at least one compound [chosen] selected from the group consisting of:

- alkoxyLATED silanes carrying at least one ethylenic unsaturation and/or at least one epoxide functional group,
- (meth)acrylates,
- metal chelates and/or alkoxides,
- crosslinkable silicone compositions and compositions which are precursors of silicone elastomers.